

REMARKS

This paper is responsive to an Office Action dated May 15, 2003. Before this response, claims 30-36 and 49-112 were pending. The Examiner has allowed claims 63-74 and 97-102. Applicant has amended claims 30, 33, 34, 49, 51-54, 61, 63, 81, 89, 90, and 93 and added new claims 113-123. Claims 30-36 and 49-123 are now pending. Applicant respectfully submits that the pending claims are allowable. In the previous office action submitted by Examiner Contee, claims 30-36 and 49-112 were allowed. Applicant respectfully submits that full faith and credit should be given to the search and action of a previous examiner unless there is a clear error in the previous action or knowledge of other prior art. See MPEP 706.04

The Examiner rejected claims 30-36, 49, 54, 58, 61, 89, 93, and 103 under 35 USC 102(b) as being anticipated by Yokoi et al (US 5,282,239) ("Yokoi"). Applicants respectfully submit that these claims as now presented are allowable over the art cited.

As amended, claim 30 recites a "transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the transmitter". In Yokoi, the motion of a portable cordless phone depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Although the portable cordless phone may be moved within the elevator independently to the motion of the moving-conveyance base station, the motion of the portable cordless phone is dependent on the motion of the elevator and, therefore, the motion of the moving-conveyance base station. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 30 and that this claim is allowable.

Regarding claims 31-33, these claims depend from claim 30 which applicant respectfully submits is allowable. Accordingly, claims 31-33 are at least allowable as depending from an allowable base claim.

Claim 34 as amended recites "a receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the receiver". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 34 and that this claim is allowable.

Claims 35 and 36 depend from claim 34 which applicant respectfully submits is allowable. Accordingly, claims 35 and 36 are at least allowable as depending from an allowable base claim.

Regarding claims 49 and 50, applicant respectfully submits that Yokoi does not teach all of the limitations of either of these claims. Claims 49 and 50 as amended recite a movable base station "wherein an actual motion of the mobile unit is independent of the motion of the movable base station". Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the movable base station". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a movable base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 49 or claim 50 and that these claims are allowable.

Claims 50-53 depend from claim 49 which applicant respectfully submits is allowable. Accordingly, claims 50-53 are at least allowable as depending from an allowable base claim.

Claims 55-62 depend from claim 54 which applicant respectfully submits is allowable. Accordingly, claims 55-62 are at least allowable as depending from an allowable base claim.

Claim 89 as amended recites a method where a motion of a transmitter is controlled “along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter.” Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the “motion of a mobile unit is independent of the motion of the transmitter”. As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 89 and that this claim is allowable.

Claim 93 as amended recites a method wherein “an actual motion of the mobile unit is independent of the motion of the receiver”. Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the “actual motion of a mobile unit is independent of the motion of the receiver”. As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 93 and that this claim is allowable.

Claim 103 recites a method comprising the step of “establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units.” Applicant respectfully submits that Yokoi does not teach this limitation. In Yokoi, the portable cordless phone within the elevator communicates with a moving-conveyance base station 10 either through a leaky coaxial cable or through an antenna when the moving-conveyance base station 10 is mounted in the elevator. In both descriptions, the moving-conveyance base station 10 is connected to the central switch through wires and not through a moving base station. (See column 3, lines 8-9 and column 4, lines 41-44). The examiner analogized the moving base station recited in claim 103 to the fixed base 4 in Yokoi. After careful examination, however, it is clear that the communication link between the fixed base 4 and the portable cordless phones does not include a moving base station. The cordless portable

phones either communicate with the fixed base 4 or with a moving conveyance base station 10. When communicating through the moving conveyance base station 10, the fixed base 4 is not used. Accordingly, the step of establishing communication link through a movable base station is not shown in Yokoi.

Claim 103 further recites "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports". Applicant respectfully submits that this step is not shown in Yokoi. As explained above, the fixed port cannot be analogized to the fixed base 4 since the moving-conveyance base station 10 does not communicate with the fixed base 4. Nowhere in Yokoi is a description of a simultaneous hand off of a plurality of mobile units from one fixed port to another where the plurality of mobile units communicates with the fixed ports through a moving base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 103 and that this claim is allowable.

The Examiner rejected claims 55, 56, 75, 76, 78, 81, and 82 under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570) ("Charas").

Regarding claim 55, this claim depends from claim 54 which applicant respectfully submits is allowable. Accordingly, claim 55 is at least allowable as depending from an allowable base claim. Further, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two, teaches or suggests every element of this claim. Claim 55 recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz". Nowhere in either reference is there a suggestion to use a single frequency band having a lower limit greater than 300 megahertz for a first communication link and for a second communication link where the first communication link is between the movable base station and the mobile unit and the second communication link is between the movable base station and the fixed port.

Applicant submits that Charas does not teach or suggest a first communication link and a second communication that are established within a frequency band having a lower limit greater than 300 megahertz. On the contrary, Charas teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . . in the range of 30 to 300 megahertz." Column 3, lines 17-18. (Also see Column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment and teaches to convert the signals to low frequency signals that can propagate through the closed

environment. In Charas, the frequency band used for communicating between the mobile units and the moving two-way frequency converter is different than the frequency band used for communicating between the moving two-way frequency converter and the base station. Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55. The signals are transmitted at 200 MHz to the moving two-way frequency converter, converted to 1500 megahertz and transmitted to the mobile units. (See column 4 lines 32-41). Applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz" and that claim 55 is allowable.

Regarding claim 56, applicant respectfully submits neither Yokoi, Charas, nor a combination of the two, teaches or suggests a frequency band having a lower limit of 300 megahertz. For support that this limitation is shown in Charas, the Examiner cites to column 3, lines 61-63. This section states:

"Propagation of the signal within the second, closed environment can be accomplished by propagating a low radio frequency signal, preferably in the range 30-300 MHz, through either a coaxial or a bifilar conductor located within the closed environment."

In Charas, therefore, 300 MHz is an upper limit, not a lower limit, of a frequency band used for communication with the non-moving base station. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest a movable base station in accordance with claim 55, wherein "the frequency band has a lower limit of 300 megahertz" and that claim 56 is allowable.

Regarding claims 75, 81, and 82, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims.

Claim 75 recites an apparatus having "a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports". Nowhere within either reference is a teaching or a suggestion to establish a communication link from a moving base station to a plurality of mobile units based on signal

quality indicators corresponding to each of a plurality of signals transmitted from fixed ports. As explained above, the moving-conveyance base stations in Yokoi are connected with wires to the central station and do not directly communicate with the fixed base. Therefore, no communication link is established between a plurality of mobile units and a fixed port based on signal quality indicators transmitted from a plurality of fixed ports. The moving-conveyance base stations are permanently connected to the same central switch. The Examiner cites to column 5, lines 47-62 and column 7 lines 21-38 for support that this element is shown. The text at column 5, lines 47-62 describes power control for a transmitter and does not suggest establishing a link between a plurality of mobile units and at least one of a plurality of fixed ports based on quality indicators transmitted corresponding to transmitted signals from the fixed ports. The text at column 7, lines 21-38 describes a method of generating a hand off request at the portable cordless unit based on a received field strength at the portable cordless phone. The text does not teach or suggest the use of a processor in an apparatus adapted to move in accordance with the movement of plurality of mobile units to establish a communication link with a fixed port based on quality indicators corresponding to signals transmitted from a plurality of fixed ports.

Charas teaches to use a coaxial cable within a closed environment for communicating with two-way frequency converters mounted on train cars and does not teach or suggest a processor within an apparatus adapted to move in accordance with the movement of plurality of mobile units that establishes a communication link with a fixed port. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 75 and that claim 75 is allowable.

Claim 81 recites an apparatus wherein the “processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators”. As explained above, neither reference teaches or suggests establishing a communication link with fixed ports using a processor within an apparatus adapted to move in accordance with a movement of a plurality of mobile units. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 81 and that claim 81 is allowable.

Regarding claim 82, this claim is at least allowable as depending from an allowable base claim.

Regarding claim 76, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of this claim. Claim 76 recites "an apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz". As explained above, Charas teaches to use a lower frequency band having an upper limit of 300 MHz for communication with the two-way frequency converters mounted in the train car. Claim 76 recites a single frequency band having a lower limit of 300 megahertz for communication between the plurality of mobile units and the apparatus and for communication between the apparatus and the fixed ports. Yokoi does not teach or suggest the use of a frequency band having lower limit of 300 megahertz. Nor does Yokoi teach or suggest communication between a moving apparatus and a plurality of mobile units and communication between the moving apparatus and a fixed port in the same frequency band. As explained above, in Yokoi, a moving-conveyance base station that is moving on an elevator does not communicate with a fixed port and is connected to the central switch with wires. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 76 and that claim 76 is allowable.

Regarding claim 78, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest the use of a millimeter wave frequency band for communication between an apparatus and a plurality of mobile units and for communication between the apparatus and a fixed port. The Examiner cites to column 4, lines 32-33 for support that this element is suggested in Yokoi. This section suggests the use of leaky wave guide for communicating with the portable cordless phones. There is no suggestion that an apparatus communicate with a fixed port using a millimeter wave frequency band. Accordingly, applicant submits that all of the elements of claim 78 are not taught or suggested in either reference and that claim 78 is allowable.

Regarding claim 77, this claim depends from claim 75 which applicant submits is allowable. Accordingly, claim 77 is at least allowable as depending from an allowable base claim.

Regarding claims 59-60, 79, and 80, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims. Yokoi does not teach or suggest the use of frequency spectrum comprising a frequency spectrum from 50 gigahertz to 70 gigahertz. Barkats teaches the use of the frequency band

between 30 GHZ to 50 GHZ and does not teach or suggest using a frequency spectrum from 50 gigahertz to 70 gigahertz. The Examiner stated that “[i]nherently a greater range would be available, e.g. 50 GHZ to 70GHZ.” Applicant submits that the frequency spectrum from 50 gigahertz to 70 gigahertz is not a greater range of the frequency band from 30 GHz to 50 GHz. The frequency spectrum from 50 gigahertz to 70 gigahertz includes the frequencies from 50 GHZ to 70 GHZ and is a distinct, non-overlapping frequency spectrum as compared to the frequency band from 30 GHZ to 50 GHZ.

The Examiner rejected claims 83-88 and 107-112 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

35 U.S.C. 112, First paragraph reads:

“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention”.

Applicant respectfully submits that claims 83-88 and 107-112 meet the requirements of 35 USC 112, first paragraph. Each of these claims recites features of the exemplary embodiment described in the specification. The “Background” of the application specifically identifies a key limitation of conventional systems by describing the problems due to mobile speed, cell size and handoff times required in conventional systems. See column 2, lines 37-48 for example. In addition, it was well known at the time filing that conventional systems were limited in performance based on the bandwidth provided to mobile units, the density of mobile units per cell, cell size, and speed of the mobile units. As explained in the background, conventional systems were limited to speeds less than 30 miles per hour due to the times required to perform a hand off. Conventional systems sacrificed one or more of the parameters to achieve increased performance in other parameters. For example, conventional systems sacrificed maximum speed of the mobile unit to increase the bandwidth per channel to each user. Further, it was well known at the time of the filing of the application that conventional systems sacrificed the number of users per cell site to increase the bandwidth per channel while supporting mobile speeds greater than 30 miles per hour. The limitations recited in claims 83-88 and 107-112 include performance parameters that could not be achieved with conventional

systems at the time of filing. Further, it was well known by those skilled in the art that the achievable performance parameters by these conventional systems fell short of the limitations claimed. Claims 83-88 and 107-112 highlight the performance features of the exemplary embodiment that can easily achieve the limitations of these claims. The description, therefore, includes such full, clear, concise and exact terms as to enable any person skilled in the art of mobile wireless communication systems to make and use the invention as claimed in claims 83-88 and 107-112. Accordingly, applicant respectfully submits that claims 83-88 and 107-112 meet the requirements of 35 U.S.C. 112 and are allowable.

The Examiner rejected claim 33 under 35 U.S.C. 112, second paragraph as being indefinite for failing to particular point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claim 33 and respectfully submits that claim 33 as amended is allowable.

Conclusion

Applicant has amended claims 30, 33, 34, 49, 51-54, 61, 63, 81, 89, 90, and 93 and added new claims 13-122. Claims 30-36 and 49-123 are now pending in the application. Applicant respectfully submits that the pending claims are allowable and that the case is in a condition for allowance.

Respectfully submitted,

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